

## WHAT IS CLAIMED IS:

1. A time scheduling system for a cellular communication system comprising;

5 multiple base stations and multiple terminals wirelessly connected to these multiple base stations, each of said multiple base station includes an allocating means for allocating a different time slot for each of said multiple terminals connected to the base station; wherein

said allocating means includes a first allocation means for allocating a  
10 different time slot among neighboring base stations for a terminal located in a boundary region of respective cells of these neighboring base stations when each of these neighboring base stations is to communicate with the terminal by allocating a time slot.

15 2. A time scheduling system according to claim 1 wherein said allocating means includes a second allocation means which allocates time slots such that when one of said neighboring base stations is transmitting to a terminal in a boundary region of respective cells of those base stations in sector  $i$  ( $i$  being a natural number equal to or less than  $N$ ) that is one of  $N$  sectors ( $N$  being an  
20 arbitrary natural number) into which the cell is divided, the other base stations transmit to terminals located in area other than the boundary region of respective cells of those base stations in the sector opposing said sector  $i$  and boundary regions in either of  $j$  ( $j$  being an integer 0 to  $N-1$ ) adjacent sectors neighboring both sides of said opposing sector.

25

3. A time scheduling system according to claim 1 wherein said allocating means includes a third allocation means which shares among neighboring base stations information on communication quality of terminals in respective cells

of those base stations and allocates time slots such that when any base stations is transmitting to a terminal the communication quality information of which is equal to or below a first threshold, the other base stations transmit to terminals the communication quality information of which is equal to or above a second  
 5 threshold which is greater than said first threshold.

4. A time scheduling system according to claim 1 wherein said allocation means includes a fourth allocation means which shares among neighboring base stations information on communication quality of terminals in respective  
 10 cells of those base stations and allocates time slots such that when any base station is transmitting to a terminal located in sector  $i$  ( $i$  being a natural number equal to or less than  $N$ , and is itself one sector of cell divided into  $N$  sectors where  $N$  is an arbitrary natural number) the communication quality information of which terminal is equal to or below a first threshold, the other  
 15 base stations transmit to terminals located in the sector opposing said sector  $i$  or in either of  $j$  ( $j$  being an integer of 0 to  $N-1$ ) adjacent sectors neighboring both sides of said opposing sector and having communication quality information equal to or above a second threshold which is greater than said first threshold, or to a terminal located in area other than said opposing sector and adjacent  
 20 sectors.

5. A time scheduling system according to claim 1 wherein said allocating means includes a fifth allocation means which shares among neighboring base stations information on communication quality of terminals in respective cells  
 25 of those base stations wherein the information on communication quality is divided into communication quality classes  $M$  ( $M$  being a natural integer) and which allocates time slots such that said neighboring base stations simultaneously transmit to terminals that have different communication

quality classes.

6. A time scheduling system according to claim 1 wherein said allocating means includes a sixth allocation means which shares among neighboring base stations information on communication quality of terminals in respective cells of those base stations wherein the information on communication quality is divided into communication quality classes M (M being a natural integer) and which allocates time slots such that said neighboring base stations transmit simultaneously to terminals of different communication quality classes and/or terminals located in non opposing sectors.

7. A time scheduling system according to claim 1 wherein said allocating means includes a seventh allocation means which uses time scheduling from said first allocation means when required communication quality through time scheduling of said first allocation means is satisfied and which allocates time slots such that only one of any of neighboring base stations transmits when required communication quality through time scheduling of said first allocation means is not satisfied.

8. A time scheduling system according to claim 2 wherein said allocating means includes an eighth allocation means which uses time scheduling from said second allocation means when required communication quality through time scheduling of said second allocation means is satisfied and which allocates time slots such that only one of any of neighboring base stations transmits when required communication quality through time scheduling of said second allocation means is not satisfied.

9. A time scheduling system according to claim 3 wherein said allocating

means includes a ninth allocation means which uses time scheduling from said third allocation means when required communication quality through time scheduling of said third allocation means is satisfied and which allocates time slots such that only one of any of neighboring base stations transmits when  
5 required communication quality through time scheduling of said third allocation means is not satisfied.

10. A time scheduling system according to claim 4 wherein said allocating means includes a tenth allocation means which uses time scheduling from said  
10 fourth allocation means when required communication quality through time scheduling of said fourth allocation means is satisfied and which allocates time slots such that only one of any of neighboring base stations transmits when required communication quality through time scheduling of said fourth allocation means is not satisfied.

15 11. A time scheduling system according to claim 5 wherein said allocating means includes an eleventh allocation means which uses time scheduling from said fifth allocation means when required communication quality through time scheduling of said fifth allocation means is satisfied and which allocates time  
20 slots such that only one of any of neighboring base stations transmit when required communication quality through time scheduling of said fifth allocation means is not satisfied.

12. A time scheduling system according to claim 6 wherein said allocating  
25 means includes a twelfth allocation means which uses time scheduling from said sixth allocation means when required communication quality through time scheduling of said sixth allocation means is satisfied and which allocates time slots such that only one of any of neighboring base stations transmits when

required communication quality through time scheduling of said sixth allocation means is not satisfied.

13. A time scheduling system according to claims 5 or 6 wherein said  
5 allocating means includes a means to allocate a time slot to a terminal which has the lowest communication quality class amongst terminals communication quality classes of which are higher than  $k$  ( $k$  being a natural number equal to or less than  $M-1$ ) when there is a vacant slot for allocation for a terminal with communication quality class  $k$ .
- 10 14. A time scheduling system according to any of claims 1 through 12 wherein at least one of the base stations amongst neighboring base stations includes a means for lowering data transmission speed.
- 15 15. A time scheduling system according to any of claims 1 through 12 wherein each base station includes a means for transmitting at a uniform transmission power from an antenna with beam directivity perpendicular in relation to the ground.
- 20 16. A time scheduling system according to any of claims 1 through 12 wherein each base station includes a means for controlling transmission power so that the received power of each terminal of each base station is uniform.
- 25 17. A time scheduling system according to any of claims 1 through 12 wherein each base station includes a means for controlling transmission power so that the received power of each terminal of each base station is uniform and for transmitting from an antenna with beam directivity perpendicular in relation to the ground.